

Boston Scientific Corporation
8 Industrial Drive
Coventry, RI 02936

**Boston
Scientific**

Advancing science for life™

December 21, 2020

RI Department of Environmental Management
Office of Air Resources
235 Promenade Street
Providence, RI 02908-5767
Attn: Ms. Ruth Gold, Supervising Air Quality Specialist

Sent via: Email and FEDEX

Subject: Addendum to Expedited Minor Source Permit Application Submittal dated 9/4/2020
Air Permit Application for Dry Bed Scrubbers for HVAC Exhaust for EF-8/Processed
Warehouse
Boston Scientific Corporation, 8 Industrial Drive, Coventry, Rhode Island

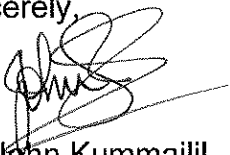
Dear Ms. Gold,

Boston Scientific Corporation (BSC) is submitting an addendum to the current permit application for the two primary tray aerators that was submitted to the Rhode Island Department of Environmental Management's Office of Air Resources (OAR) on September 4, 2020. As detailed in a letter submitted to the OAR on November 17, 2020, BSC has chosen to install four AAT dry bed scrubbers in parallel, on the exhaust duct for the Processed Warehouse (EF-8) prior to discharge to the atmosphere. This project is being implemented as part of BSC's continuous improvement efforts and will reduce fugitive emissions from the facility. These dry bed scrubbers are identical to those currently in use at the facility and have been demonstrated effective for ethylene oxide removal from the exhaust gases from the aeration chambers, the wet acid scrubber exhaust and the sterilizer back vents.

Per the direction provided in Mr. Jikku Samuel's email correspondence dated November 18, 2020, BSC is submitting the air pollution control permit application for the Processed Warehouse dry bed scrubbers, along with a check for the \$1,271 for the Air Pollution Control Permit Fee. The proposed permit has been revised to incorporate the proposed monitoring for the Processed Warehouse dry bed scrubbers for proper operation and is included as an attachment to this addendum. As requested, BSC is also providing a table with this submittal which provides an updated schedule of all exhaust fans for the facility, along with the associated flowrates and sources of emissions.

Please feel free to contact me at 1-508-948-8696 or at john.kummailil@bsci.com if you should have any questions or require additional information pertaining to this submission.

Sincerely,



Dr. John Kummailil
Acting Director of Operations

Attach:

Application for Air Pollution Control Equipment-Dry Bed Scrubbers
Process Flow Diagram, Processed Warehouse Dry Bed Scrubbers
Check for Air Pollution Control Permit Fee \$1,271
Appendix D Red-line Strike-out Version of Draft Permit updated December 2020
Appendix D Clean draft version of proposed permit, changes accepted
AAT Dry Bed Scrubber Specifications
Appendix E, revised December 2020
Table 1, Exhaust Fan Schedule, BSC Coventry

**RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES**

**APPLICATION FOR APPROVAL OF PLANS TO CONSTRUCT,
INSTALL, OR MODIFY AIR POLLUTION CONTROL EQUIPMENT**

Return to: RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION CENTER
235 PROMENADE STREET
PROVIDENCE, RI 02908

Section A

1. FULL BUSINESS NAME Boston Scientific Corporation PHONE 508-948-8696

2. ADDRESS OF EQUIPMENT LOCATION 8 Industrial Drive, Coventry, RI 02816
SIC CODE 7389 # EMPLOYEES 38

3. LOCATION ON PREMISES (BLDG., DEPT., AREA, ETC.) Processed Warehouse

4. NATURE OF BUSINESS Sterilization of medical devices

Section B

1. APPROVAL REQUESTED FOR: ☒ CONSTRUCTION ☐ MODIFICATION

2. TYPE OF EQUIPMENT: ☐ BAGHOUSE ☐ SCRUBBER ☐ AFTERBURNER
☐ SCR ☐ CARBON ADSORBER ☒ OTHER (SPECIFY)

3. MAKE AND MODEL NO.: 4 Adv Air Technologies Reactant Media Dry Bed Scrubbers

4. ESTIMATED STARTING DATE: December 2020 ESTIMATED COMPLETION DATE: December 2020

Section C

1. GENERAL DESCRIPTION OF PROCESS FROM WHICH POLLUTANTS ARISE
Removal of ethylene oxide from Processed Warehouse Ventilation System.

2. PROCESS EQUIPMENT USED IN OPERATION Not applicable

3. OPERATING PROCEDURE: ☒ CONTINUOUS 24 HRS/DAY 7 DAYS/WEEK 52 WEEKS/YEAR
☐ BATCH _____ HRS/BATCH _____ BATCHES/WEEK _____ WEEKS/YEAR

4. LIST THE TYPE AND QUANTITY OF RAW MATERIALS USED PER HOUR OR PER BATCH ON AN ATTACHED SHEET.

Section D

EMISSIONS INFORMATION:

POLLUTANT	EMISSIONS BEFORE CONTROL EQUIPMENT	AFTER
ethylene oxide	0.017 lbs/hr (avg)	0.00017 lbs/hr
	0.029 lbs/hr (potential)	0.00029 lbs/hr


INDICATE METHOD USED TO DETERMINE EMISSIONS Life Safety GC Readings & exhaust flowrate

AP-CE

Section E	EMISSION STREAM CHARACTERISTICS 1. MAXIMUM FLOW RATE (SCFM) <u>6,123 acfm</u> 2. TEMPERATURE (°F) <u>~70 degrees F</u> 3. MOISTURE CONTENT <u>ambient air</u> % 4. HALOGENATED ORGANICS: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 5. HEAT CONTENT (IF APPLICABLE) <u>NA</u> BTU/SCF
Section F	SCRUBBER 1. WET:SCRUBBING LIQUID (A) COMPOSITION _____ (B) FLOW RATE (GAL/MIN) _____ (C) INJECTION RATE (PSI) _____ (D) MAKE-UP RATE IF RE-CIRCULATED (GAL/MIN) _____ PACKING-IF APPLICABLE (A) TYPE _____ (B) DEPTH OF BED _____ (FEET) (C) PACKING SURFACE _____ (FT ²) 2. DRY:SCRUBBING REAGENT: <u>AAT SafeCell II Reactant Media</u> USAGE <u>variable</u> LB/HR. INJECTION RATIO: <u>fixed volume of reactant media</u> () MIXING METHOD <u>na</u> 3. PRESSURE DROP ACROSS CONTROL UNIT: <u>max ~6-7</u> INCHES WATER
	BAGHOUSE/FABRIC FILTER 1. BAG/FILTER MATERIAL _____ 2. NUMBER OF BAGS _____ 3. AIR/CLOTH RATIO _____ FEET/MINUTE 4. METHOD OF CLEANING: (A) <input type="checkbox"/> SHAKER <input type="checkbox"/> PULSE <input type="checkbox"/> REVERSE AIR <input type="checkbox"/> OTHER-SPECIFY (B) FREQUENCY OF CLEANING _____ (C) IS CLEANING AUTOMATIC OR MANUAL _____
	CARBON ADSORBER 1. VOLUME OF EACH CARBON BED _____ (FT ³) 2. NUMBER OF BEDS _____ 3. DIAMETER OF EACH BED _____ (FT) 4. DEPTH OF EACH BED _____ (FT) 5. ADSORPTION CAPACITY OF CARBON (LB/100 LB CARBON) _____ 6. ADSORPTION CYCLE TIME _____ (HR) 7. REGENERATION CYCLE TIME _____ (HR) 8. STEAM RATIO (LB STEAM/LB CARBON) _____ 9. STEAM SOURCE _____ 10. REMOVAL EFFICIENCY (%) _____
	INCINERATION 1. THERMAL AFTERBURNER A. VOLUME OF COMBUSTION CHAMBER _____ (FT ³) B. MINIMUM OPERATING TEMPERATURE _____ (°F) C. RESIDENCE TIME _____ (SECONDS) D. EXCESS AIR _____ % 2. CATALYTIC INCINERATION A. TYPE OF CATALYST _____ B. VOLUME OF CATALYST _____ (FT ³) C. SPACE VELOCITY _____ (HR ⁻¹) D. CATALYST OPERATING TEMPERATURE _____ (°F)

	<p>INCINERATION (CONT.)</p> <p>3. BURNER MAKE AND MODEL NO. _____ CAPACITY (BTU/HR) _____</p> <p>4. HEAT RECOVERY: <input type="checkbox"/> YES <input type="checkbox"/> NO TYPE: _____ EFFICIENCY: _____ %</p> <p>4. DESTRUCTION EFFICIENCY: _____ %</p>
Section G	<p>OPERATING CONDITIONS</p> <p>1. GAS VOLUME THROUGH CONTROL SYSTEM: NORMAL <u>6,123</u> ACFM @ <u>70</u> °F MAXIMUM <u>6,123</u> ACFM @ <u>70</u> °F</p> <p>2. GAS TEMPERATURE: INLET <u>70</u> °F OUTLET <u>70</u> °F</p> <p>3. STACK INFORMATION: (A) I.D. <u>18</u> INCHES OR _____ INCHES X _____ INCHES (B) STACK HEIGHT ABOVE GROUND <u>26.5</u> FEET (C) CFM EXHAUSTED <u>6,123</u> (D) IS STACK EQUIPPED WITH RAIN HAT? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO</p> <p>5. DISTANCE FROM DISCHARGE TO NEAREST PROPERTY LINE _____ FEET.</p>
Section H	<p>COLLECTION DATA</p> <p>1. DESCRIPTION OF COLLECTED MATERIAL <u>spent dry bed reactant media</u></p> <p>2. AMOUNT COLLECTED (LBS/DAY; GAL/DAY; ETC.) <u>variable depending upon site operations</u></p> <p>3. ULTIMATE DISPOSITION OF COLLECTED MATERIAL <u>spent dry bed reactant media disposed of as solid waste</u></p>
Section I	<p>IN ADDITION TO THE ABOVE INFORMATION, THE FOLLOWING INFORMATION IS <u>REQUIRED</u>:</p> <p>1. FLOW DIAGRAM SHOWING RELATIVE LOCATION OF EQUIPMENT ATTACHED TO THIS CONTROL SYSTEM.</p> <p>2. MANUFACTURER'S LITERATURE FOR THE CONTROL EQUIPMENT.</p> <p>3. ENGINEERING DRAWINGS FOR THE CONTROL EQUIPMENT WITH PHYSICAL DIMENSIONS.</p> <p>4. PARTICULATE COLLECTION EQUIPMENT SHOULD HAVE SIZE EFFICIENCY CURVES, ABSORPTION AND ADSORPTION EQUIPMENT SHOULD HAVE SIZING CALCULATIONS, GRAPHS, EQUILIBRIUM DATA, ETC.</p>

This application is submitted in accordance with the provisions of Chapter 23-23 of the General Laws, as amended, Regulation 9, and to the best of my knowledge and belief is true and correct.



 Signature
JOHN KUMMAILIL
 Printed Name

ACTING DIR. OPERATIONS

 Title
DEC 21, 2020
 Date

**RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES**

AIR POLLUTION CONTROL PERMIT FEES

The Department's rules and regulations require the payment of fees for air pollution permits. All application fees must be submitted with permit application to:

RI Department of Environmental Management
Permit Application Center
235 Promenade Street
Providence, RI 02908

THE APPLICATION FORM AND ANY ACCOMPANYING DOCUMENTS SHOULD BE SUBMITTED TO THE OFFICE OF AIR RESOURCES AT THE ADDRESS SHOWN ON THE APPLICATION FORM.

Please complete this form, attach it to the check or money order and submit it to the Office of Air Resources. Payment should be made payable to General Treasurer, State of Rhode Island. The information requested below must be provided to coordinate the filing of your fee with your application(s). This fee is a filing fee and therefore it must be paid before we can begin review of your application(s).

APPLICANT'S NAME: Boston Scientific Corporation

GENERAL DESCRIPTION OF PROCESS FROM WHICH POLLUTANTS ARISE:

Removal of ethylene oxide from processed warehouse ventilation exhaust.

FEE SUBMITTED:

Major Source or Major Modification @ \$25,410 each
Complex Minor source or Modification @ \$4,620.00 each
Minor source or Modification @ \$ 1,271.00 each

1 x \$1,271

TOTAL

\$1,271

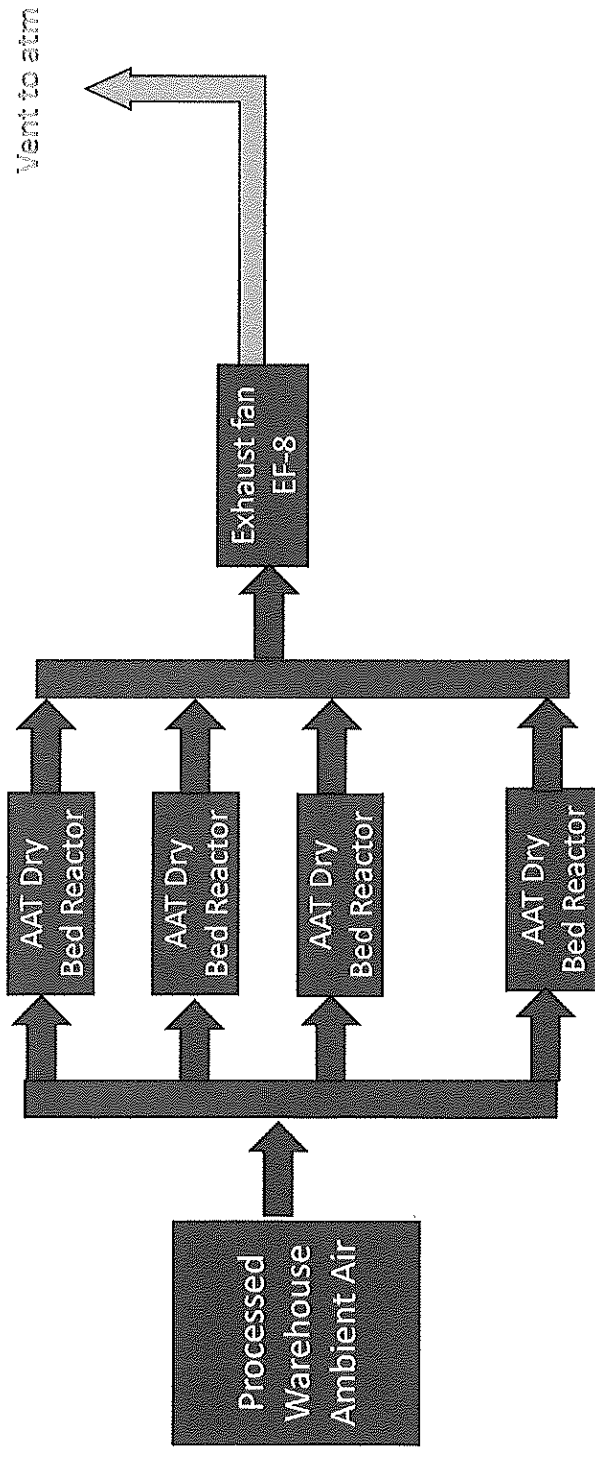
FOR OFFICE USE ONLY:

Fee Amount Received: \$ _____

Date Received: _____

Received By: _____

For Deposit into Account 1752-80600



BSC Coventry Processed Warehouse Process Flow Diagram

2068

53-13/110 MA
26562

DEC 21, 2020
Date

Pay to the
Order of GENERAL TREASURER, STATE OF RI \$ 1,271.00

One thousand two hundred seventy one Dollars



Photo
Safe
Deposit
Details on back

Bank of America 

ACH R/T 011000138

For COVENTRY AIR PERMIT

Monetary Order

BLUE SHEPHERD

Revised Appendix D

December 2020

~~17 October 2011-1821 December 2020~~

~~Mr. Leonard Sarapas Dr. John Kummailil~~
Boston Scientific Corporation
8 Industrial Drive
Coventry, RI 02816

Dear ~~DMr. Sarapas~~Kummailil,

The Department of Environmental Management, Office of Air Resources has reviewed and approved your application for the installation of ~~process~~ equipment and air pollution control equipment to be located at your 8 Industrial Drive, Coventry facility.

Enclosed is a minor source permit pursuant to our review of your application (Approval Nos. ~~2114, 2131-2134, XXXX and XXXX~~).

The permit conditions and emission limitations in this permit also incorporate and include those in Approval Nos. 2114 and 2131-2134, issued on 17 October 2011. Hereinafter the design, construction, and operation of all the equipment addressed in this approval shall be subject to the permit conditions and emission limitations contained in this modified minor source permit.

If there are any questions concerning this permit, please contact me at 222-2808, extension 7110.

~~The permit conditions and emission limitations in this permit also incorporate and include those in Approval No. 2114 issued on 30 September 2010. Hereinafter the design, construction, and operation of all the equipment addressed in this approval shall be subject to the permit conditions and emission limitations contained in this minor source permit.~~

~~If there are any questions concerning this permit, please contact me at 222-2808, extension 7028.~~

Sincerely,

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

MINOR SOURCE PERMIT

BOSTON SCIENTIFIC CORPORATION

APPROVAL NOS. 2114, 2131-2134, XXXX and XXXX~~2114 and 2131-2134~~

Pursuant to the provisions of Air Pollution Control Regulation No. 9, this minor source permit is issued to:

Boston Scientific Corporation.

For the following:

~~Installation-Continued operation of three existing sterilization chambers (Approval Nos. 2131-2133) and installation-existing~~

~~of a new air pollution control system (Approval No. 2134) to reduce emissions of~~

~~ethylene oxide from the sterilization process. Installation of two primary tray aerators to be operated in parallel in an N+1 configuration. The primary tray aerator will remove ethylene oxide from wastewater produced during the sterilization process. The processed air containing ethylene oxide from these tray aerators will be routed to the existing air pollution control system, consisting of a Verantis wet acid scrubber and then to the existing three (3) AAT dry bed scrubbers operating in parallel (Approval No. 2134). The existing air pollution control system has the capacity to treat the process air from the tray aerators. Installation of four dedicated dry bed scrubbers operated in parallel to treat the exhaust air stream from the ventilation system of the Processed Warehouse.~~

Located at: 8 Industrial Drive, Coventry

This permit shall be effective from the date of its issuance and shall remain in effect until revoked by or surrendered to the Department. This permit does not relieve *Boston Scientific Corporation* from compliance with applicable state and federal air

Aleida M. Whitney
Air Quality Specialist
Office of Air Resources

cc: Coventry Building Official

pollution control rules and regulations. The design, construction and operation of this equipment shall be subject to the attached permit conditions and emission limitations.

~~Douglas McVay, Acting Chief~~Laurie Grandchamp, Administrator
Date of Issuance
Office of Air Resources

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

BOSTON SCIENTIFIC CORPORATION

APPROVAL NOs. 2114 and 2131 - 2134

Permit Conditions and Emission Limitations

A. Emission Limitations

~~1. Emissions of ethylene oxide from each sterilizer chamber vent shall be treated by an air pollution control system ("APCS") consisting of a Verantis-wet acid scrubber ("wet acid scrubber") in combination with three (3) Advanced Air Technologies dry bed scrubbers ("dry bed scrubbers"). In addition, each sterilizer back vent exhaust shall be treated with the same three (3) up to four Advanced Air Technologies (AAT) dry bed scrubbers.~~

~~1.~~

~~1.~~

~~2. Emissions of ethylene oxide discharged from the aeration cells and each sterilizer rear exhaust/chamber exhaust vent shall be treated in a combined gas stream in the by a dedicated dry bed scrubber ("aeration cells dry bed scrubber"), section of the air pollution control system.~~

~~2.~~

~~Emissions of ethylene oxide discharged from the primary tray aerators shall be treated by the APCS.~~

~~3.~~

~~3. Emissions of ethylene oxide discharged from the ethylene glycol and wastewater tank vents shall be vented to the APCS for treatment.~~

~~4.~~

~~4. The ventilation exhaust from the Processed Warehouse Exhaust Fan (EF-8) shall be routed to four dedicated dry bed scrubbers operated in parallel prior to discharge to the atmosphere.~~

~~5.~~

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

5. Emissions of ethylene oxide discharged to the atmosphere from the aeration cells dry bed scrubber shall be reduced to a maximum concentration of 1 ppm, calculated as a 24-hour daily average, or by at least 99 percent, whichever is less stringent.

6.

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

7. The emissions of ethylene oxide from the combined exhaust from the APCS and the aeration cells dry bed scrubber shall be reduced by 99.9% or greater before discharge to the atmosphere. This will be calculated annually using the following equation:

Formatted: Space After: 6 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

(Mass of EO used minus Mass of EO post APCS and aeration cells dry bed scrubber) divided by the mass of EO used

Formatted: Centered, Indent: Left: 0.75", Hanging: 0.5", No bullets or numbering

Where:

Formatted: Indent: Left: 1.06", No bullets or numbering

EO concentration measurements will be recorded by a RIDEM approved monitoring device. C (currently a Gas Chromatograph (GC)) is the approved monitoring device.

Formatted: Indent: Left: 0.5", No bullets or numbering

8.

Formatted: Indent: Left: 1", No bullets or numbering

9. The concentration of ethylene oxide discharged to the atmosphere from the air pollution control system APCS and the aeration cells dry bed scrubber shall not exceed 4.4 ppmv calculated as a 24-hour daily average.

Formatted: Space After: 12 pt

8.

Formatted: Indent: Left: 0.5", Space After: 12 pt

10. Emissions of ethylene oxide discharged to the atmosphere from the four dry bed scrubbers for the Processed Warehouse shall be reduced by a minimum of 99%.

Formatted: Indent: Left: 1", Hanging: 0.5", Space After: 12 pt, Tab stops: 1", List tab

Formatted: Indent: Left: 0.5", Space After: 12 pt

9.

Formatted: Not Superscript/ Subscript

10. Emissions of ethylene oxide from the entire facility shall not exceed:

Formatted: Indent: Left: 0.5", First line: 0", Space After: 12 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.81" + Indent at: 1.06", Tab stops: 1", List tab

Formatted: Indent: Left: 0.5", Space After: 12 pt

a. 67 lbs per day

b. 1,298 lbs per year

B. Operating Requirements

1. ~~The average daily usage of ethylene oxide at the facility shall not exceed 1,114.2 lbs (calendar-month average).~~

Commented [RA1]: Requesting that this be removed from permit since it has no relationship to emission limits.

2. The maximum daily usage of ethylene oxide at the facility shall not exceed 1,500 lbs.

1.
3. The vacuum pump used to evacuate the sterilizer during the sterilization cycles shall be of a recirculating design.

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Tab after: 1" + Indent at: 1"

4.2. No more than nine sterilizer chamber vents shall be discharged to the air pollution control system at any time.

3. The dry bed scrubbers for the Processed Warehouse shall be operated and maintained in accordance with the manufacturers' manufacture's recommendations.

5. ~~No more than five aeration cells and five sterilizer rear exhausts/chamber exhaust vents shall be discharged to the air pollution control system at any time.~~

Formatted: Indent: Left: -0.5"

Commented [RA2]: Requesting removal conflicts with previous condition.

C. Monitoring

—The owner/operator shall, if complying with Condition A.3 of this minor source permit using a control technology other than acid-water scrubbers or catalytic or thermal oxidizers, provide to the Administrator of the USEPA (Administrator) information describing the design and operation of the air pollution control system, including recommendations for operating parameters to be monitored to demonstrate continuous compliance. Based on this information, the Administrator will determine the operating parameters to be measured during the performance test. During the performance test required in Condition D.1 of this minor source permit, using the methods approved in 40 CFR 63.365(g), the owner/operator shall determine site-specific operating limits for the operating parameters approved by the Administrator.

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5"

1.

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5", Hyphenate, Tab stops: Not at -1.38"

4. The owner/operator shall monitor the parameters as approved by the Administrator in Condition C.1 of this minor source permit using the methods and procedures in 40 CFR 63.365(g).

Formatted: Not Expanded by / Condensed by

2.

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5"

—The owner/operator shall measure and record, once per hour, the ethylene oxide concentration at:

Formatted: Not Expanded by / Condensed by

3.

—the combined outlet of the aeration cells dry bed scrubber and the APCS; and

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5", Hyphenate, Tab stops: Not at -1.38"

a.

Formatted: Not Expanded by / Condensed by

—the outlet of the aeration cells dry bed scrubber.

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75", Hyphenate, Tab stops: Not at -1.38"

b.

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

—Monitoring is required during those times when the aeration cells dry bed scrubber and/or APCS is operational.

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

4.

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75", Hyphenate, Tab stops: Not at -1.38"

5. The pressure drop across each of the dry bed scrubbers for the Processed Warehouse shall be monitored.

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5", Hyphenate, Tab stops: Not at -1.38"

Formatted: Not Expanded by / Condensed by

2. The owner/operator shall collect and record once per week the concentration of a 15-minute ethylene oxide bag sample at the final outlet of the air pollution control system. Monitoring is required during a week only if the air pollution control system has been operated.

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5"

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5", Hyphenate, Tab stops: Not at -1.38"

D. Emission Testing

Formatted: Not Expanded by / Condensed by

1. Within 180 days of start-up of the new air pollution control system, and approval of the operating parameters by the Administrator, emissions testing shall be conducted to demonstrate compliance with Conditions A.3 following the procedures in 40 CFR 63.365 (b) and A.4 following the procedures in 40 CFR 63.365 (c).

Formatted: Space After: 12 pt, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5"

Formatted: Not Expanded by / Condensed by

2. An emission testing protocol shall be submitted to the Office of Air Resources for review at least 60 days prior to the performance of any emissions tests. The owner/operator shall provide the Office of Air Resources at least 60 days prior notice of any emissions test.

Formatted: No bullets or numbering, Hyphenate, Tab stops: Not at -1.38"

Commented [RA3]: Requesting removal of this section in permit since initial compliance testing has already been conducted?

3. All test procedures used for compliance testing shall be approved by the Office of Air Resources prior to the performance of any emissions test.

4. The owner/operator shall install any and all test ports or platforms necessary to conduct the required emissions testing, provide safe access to any

platforms, and provide the necessary utilities for sampling and testing equipment.

5. All emissions testing shall be conducted under operating conditions deemed acceptable and representative for the purpose of assessing compliance with the applicable emission limitations or air quality standards.
6. A final report of the results of emissions testing shall be submitted to the Office of Air Resources no later than 60 days following completion of the testing.
7. All emissions testing must be observed by the Office of Air Resources or its authorized representatives to be considered acceptable, unless the Office of Air Resources provides authorization to the owner/operator to conduct the testing without an observer present.

E.D. Recordkeeping and Reporting

1. The owner/operator shall maintain the following records:

a. The daily average amount of ethylene oxide, in pounds, loaded into the sterilizers, calculated as the amount of ethylene oxide, in pounds, loaded into the sterilizers per month divided by the number of operating days in that month.

Formatted: Indent: Hanging: 0.44"

b.a. The daily and twelve-month rolling total amount of ethylene oxide, in pounds, discharged from the entire facility per month. If the amount of ethylene oxide discharged from the entire facility in a month exceeds the allowable daily emissions specified in Condition A.5.a of this permit, the facility shall provide, to the Office of Air Resources, additional supporting documentation to demonstrate that the allowable daily emissions were not exceeded during that month.

Formatted: Indent: Hanging: 0.44", Numbered + Level: 1 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 1" + Tab after: 1.5" + Indent at: 1.5"

Formatted: Indent: Hanging: 0.44"

b. The concentration of ethylene oxide at the following locations (final outlet of the air pollution control system as required in Condition C.3 of this minor source permit.

- i. the combined outlet of the aeration cells dry bed scrubber and the APCS; and
- ii. the outlet of the aeration cells dry bed scrubber.

Formatted: Indent: Left: 1.63", Hanging: 0.06", Tab stops: 1.69", List tab + Not at 1.5"

c. The pressure drop across each of the dry bed scrubbers for the Processed Warehouse shall be recorded weekly.

Formatted: Not Highlight

Formatted: Not Highlight

d. The dates the reactant media is changed in each of the dry bed scrubbers, section of the air pollution control system.

2. The owner/operator shall notify the Office of Air Resources, in writing, of the date of initial start-up of the ~~primary tray aerators new-sterilization chambers and the dry bed scrubbers for the Processed Warehouse new-air pollution control system~~ no later than fifteen days after start-up.
3. The owner/operator shall notify the Office of Air Resources in writing , of any noncompliance with the terms of this permit or any other air pollution control rule or regulation within 30 calendar days of becoming aware of such occurrence and supply the director with the following information:
 - a. The name and location of the facility;
 - b. The subject source(s) that caused the noncompliance with the permit term;
 - c. The time and date of first observation of the incident of noncompliance;
 - d. The cause and expected duration of the incident of noncompliance;
 - e. The estimated rate of emissions (expressed in lbs/hr or lbs/day) during the incident and the operating data and calculations used in estimating the emission rate; and,
 - f. The proposed corrective actions and schedule to correct the conditions causing the incident of noncompliance.
4. The owner/operator shall notify the Office of Air Resources in writing of any planned physical or operational change to any equipment that would:
 - a. Change the representation of the facility in the application.
 - b. Alter the applicability of any state or federal air pollution rules or regulations.
 - c. Result in the violation of any terms or conditions of this permit.
 - d. Qualify as a modification under APC Regulation No. 9.

Such notification shall include:

- Information describing the nature of the change.
- Information describing the effect of the change on the emission of any air contaminant.

- The scheduled completion date of the planned change.

Any such change shall be consistent with the appropriate regulation and have the prior approval of the Director.

5. All records required in this permit shall be maintained for a minimum of five years after the date of each record and shall be made available to representatives of the Office of Air Resources upon request.

F.E. Other Permit Conditions

4. There shall be no bypassing of the air pollution control system during times when ethylene oxide emissions are being discharged to the device.

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

1.

2. To the extent consistent with the requirements of this permit and applicable federal and state laws, the facility shall be designed, constructed and operated in accordance with the representation of the facility in the permit application dated application dated July 1, 2019 prepared by Environmental Strategies & Management, Inc (ES&M), and later supplemented by:

a. ES&M on December 17, 2019 and September 04, 2020; and

b. Boston Scientific on December 21, 2020

Formatted: Indent: Left: 0.75", No bullets or numbering, Tab stops: Not at 1.19"

2. March 3, 2011 prepared by ARCADIS.

Formatted: Justified, Indent: Left: 0.5", No bullets or numbering

3. Employees of the Office of Air Resources and its authorized representatives shall be allowed to enter the facility at all times for the purpose of inspecting any air pollution source, investigation any condition it believes may be causing air pollution or examining any records the Office of Air Resources requires to be maintained.

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

4. The owner/operator is subject to the requirements of the General Duty Clause, Section 112(r)(1) of the Clean Air Act. Under this clause, the facility is responsible for but not limited to:

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

- a. identifying hazards that may result from accidental releases;
- b. designing and maintaining a safe facility; and,
- c. minimizing the consequences of releases when they occur.

5. At all times, including periods of startup, shutdown and malfunction, the owner/operator shall, to the extent practicable, maintain and operate the facility in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

maintenance procedures are being used will be based on information available to the Office of Air Resources, which may include, but is not limited to, monitoring results, opacity observations, review of operating maintenance procedures and inspection of the source.

6. The facility is subject to the requirements of 40 CFR 63, Subpart A, "General Provisions" and Subpart O, "Ethylene Oxide Emissions Standards for Sterilization Facilities". Compliance with all applicable provisions therein, including any monitoring required pursuant to Condition C.1, is required unless otherwise stated in this permit. If there is any conflict between any term or condition of this permit and the applicable provisions of 40 CFR 63, the owner/operator shall comply with the most stringent requirement.

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

- ~~7. Approval No. 1280 issued on 5 May 1994 for the installation of a Donaldson catalytic oxidizer, Approval No. 1394 issued on 15 October 1996 for the installation of a Glygen 2000 scrubber and Approval No. 1612 issued on 14 August 2001 for the installation of a Lantec Q-Pac scrubber shall be revoked effective with the successful testing and acceptance of the Verantis wet acid scrubber/AAT dry bed scrubber air pollution control system. The owner/operator shall notify the Office of Air Resources upon acceptance of the air pollution control system.~~

Commented [RA4]: Request removal of this condition as it is obsolete.

- 8.7. The emission and dispersion characteristics of all sources of ethylene oxide at the facility shall be consistent with the parameters used in the air quality modeling to demonstrate that the emissions of ethylene oxide does not cause an impact, at or beyond the property line of the facility, which exceeds the Acceptable Ambient Level for that substance. The Office of Air Resources, in its sole discretion, may reopen this minor source permit if it determines that the emission and dispersion characteristics have changed significantly and that emission limitations must be revised to ensure compliance with Air Pollution Control Regulation No. 22.

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

G.F. Malfunctions

1. Malfunction means a sudden and unavoidable breakdown of process or control equipment. In the case of a malfunction of any air pollution control system, all reasonable measures shall be taken to assure resumption of the designed control efficiency as soon as possible. In the event that the malfunction of an air pollution control system is expected of may reasonably be expected to continue for longer than 24 hours and if the owner/operator wishes to operate the source on which it is installed at any time beyond that period, the Director shall be petitioned for a variance under Section 23-23-15 of the General Laws of Rhode Island, as amended. Such petition shall include, but is not limited to, the following:
 - a. Identification of the specific air pollution control system and source on which it is installed;

- b. The expected period of time that the air pollution control system will be malfunctioning or out of service;
 - c. The nature and quantity of air contaminants likely to be emitted during said period;
 - d. Measures that will be taken to minimize the length of said period;
 - e. The reasons that it would be impossible or impractical to cease the source operation during said period.
2. The owner/operator may seek to establish that a malfunction of any air pollution control system that would result in noncompliance with any of the terms of this permit or any other applicable air pollution control rules and regulations was due to unavoidable increases in emissions attributable to the malfunction. To do so, the owner/operator must demonstrate to the Office of Air Resources that:
- a. The malfunction was not attributable to improperly designed equipment, lack of preventative maintenance, careless or improper operation or operator error;
 - b. The malfunction is not part of a recurring pattern indicative of inadequate design, operation or maintenance;
 - c. Repairs were performed in an expeditious fashion. Off-shift labor and overtime should be utilized, to the extent practicable, to ensure that such repairs were completed as expeditiously as practicable.
 - d. All possible steps were taken to minimize emissions during the period of time that repairs were performed.
 - e. Emissions during the period of time that repairs were performed will not:
 - (1) Cause an increase in the ground level ambient concentration at or beyond the property line in excess of that allowed by Air Pollution Control Regulation No. 22 and any Calculated Acceptable Ambient Levels; and
 - (2) Cause or contribute to air pollution in violation of any applicable state or national ambient air quality standard.
 - f. The reasons that it would be impossible or impractical to cease the source operation during said period.

- g. The owner/operator's actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs or other relevant evidence.

This demonstration must be provided to the Office of Air Resources within two working days of the time when the malfunction occurred and contain a description of the malfunction, any steps taken to minimize emissions and corrective actions taken.

The owner/operator shall have the burden of proof in seeking to establish that noncompliance was due to unavoidable increases in emissions attributable to the malfunction.

Formatted: Left

21 December 2020

Dr. John Kummailil
Boston Scientific Corporation
8 Industrial Drive
Coventry, RI 02816

Dear Dr. Kummailil,

The Department of Environmental Management, Office of Air Resources has reviewed and approved your application for the installation of air pollution control equipment to be located at your 8 Industrial Drive, Coventry facility.

Enclosed is a minor source permit pursuant to our review of your application (Approval Nos. 2114, 2131-2134, XXXX and XXXX).

The permit conditions and emission limitations in this permit also incorporate and include those in Approval Nos. 2114 and 2131-2134, issued on 17 October 2011. Hereinafter the design, construction, and operation of all the equipment addressed in this approval shall be subject to the permit conditions and emission limitations contained in this modified minor source permit.

If there are any questions concerning this permit, please contact me at 222-2808, extension 7110.

Sincerely,

Aleida M. Whitney
Air Quality Specialist
Office of Air Resources

cc: Coventry Building Official

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

MINOR SOURCE PERMIT

BOSTON SCIENTIFIC CORPORATION

APPROVAL NOs. 2114, 2131-2134, XXXX and XXXX

Pursuant to the provisions of Air Pollution Control Regulation No. 9, this minor source permit is issued to:

Boston Scientific Corporation.

For the following:

Continued operation of three existing sterilization chambers (Approval Nos. 2131-2133) and existing

air pollution control system (Approval No. 2134) to reduce emissions of

ethylene oxide from the sterilization process. Installation of two primary tray aerators to be operated in parallel in an N+1 configuration. The primary tray aerator will remove ethylene oxide from wastewater produced during the sterilization process. The processed air containing ethylene oxide from these tray aerators will be routed to the existing air pollution control system, consisting of a Verantis wet acid scrubber and then to the existing three (3) AAT dry bed scrubbers operating in parallel (Approval No. 2134). The existing air pollution control system has the capacity to treat the process air from the tray aerators. Installation of four dedicated dry bed scrubbers operated in parallel to treat the exhaust air stream from the ventilation system of the Processed Warehouse.

Located at:

8 Industrial Drive, Coventry

This permit shall be effective from the date of its issuance and shall remain in effect until revoked by or surrendered to the Department. This permit does not relieve *Boston Scientific Corporation* from compliance with applicable state and federal air pollution control rules and regulations. The design, construction and operation of

this equipment shall be subject to the attached permit conditions and emission limitations.

Laurie Grandchamp, Administrator
Office of Air Resources

Date of Issuance

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES**

BOSTON SCIENTIFIC CORPORATION

APPROVAL NOs. 2114 and 2131 - 2134

Permit Conditions and Emission Limitations

A. Emission Limitations

1. Emissions of ethylene oxide from each sterilizer chamber vent shall be treated by an air pollution control system ("APCS") consisting of a wet acid scrubber in combination with three (3) Advanced Air Technologies dry bed scrubbers ("dry bed scrubbers"). In addition, each sterilizer back vent exhaust shall be treated with the same three (3) dry bed scrubbers.
2. Emissions of ethylene oxide discharged from the aeration cells shall be treated by a dedicated dry bed scrubber ("aeration cells dry bed scrubber").
3. Emissions of ethylene oxide discharged from the primary tray aerators shall be treated by the APCS.
4. Emissions of ethylene oxide discharged from the ethylene glycol and wastewater tank vents shall be vented to the APCS for treatment.
5. The ventilation exhaust from the Processed Warehouse Exhaust Fan (EF-8) shall be routed to four dedicated dry bed scrubbers operated in parallel prior to discharge to the atmosphere.
6. Emissions of ethylene oxide discharged to the atmosphere from the aeration cells dry bed scrubber shall be reduced to a maximum concentration of 1 ppm_v calculated as a 24-hour daily average, or by at least 99 percent, whichever is less stringent.
7. The emissions of ethylene oxide from the combined exhaust from the APCS and the aeration cells dry bed scrubber shall be reduced by 99.9% or greater before discharge to the atmosphere. This will be calculated annually using the following equation:

(Mass of EO used minus Mass of EO post APCS and aeration cells dry bed scrubber) divided by the mass of EO used

Where:

EO concentration measurements will be recorded by a RIDEM approved monitoring device. Currently a Gas Chromatograph (GC) is the approved monitoring device.

8. The concentration of ethylene oxide discharged to the atmosphere from the APCS and the aeration cells dry bed scrubber shall not exceed 4.4 ppmv calculated as a 24-hour daily average.
9. Emissions of ethylene oxide discharged to the atmosphere from the four dry bed scrubbers for the Processed Warehouse shall be reduced by a minimum of 99%.
10. Emissions of ethylene oxide from the entire facility shall not exceed:
 - a. 67 lbs per day
 - b. 1,298 lbs per year

B. Operating Requirements

1. The maximum daily usage of ethylene oxide at the facility shall not exceed 1,500 lbs.
2. No more than nine sterilizer chamber vents shall be discharged to the air pollution control system at any time.
3. The dry bed scrubbers for the Processed Warehouse shall be operated and maintained in accordance with the manufacturers' recommendations.

C. Monitoring

1. The owner/operator shall, if complying with Condition A.3 of this minor source permit using a control technology other than acid-water scrubbers or catalytic or thermal oxidizers, provide to the Administrator of the USEPA (Administrator) information describing the design and operation of the air pollution control system, including recommendations for operating parameters to be monitored to demonstrate continuous compliance. Based on this information, the Administrator will determine the operating parameters to be measured during the performance test. During the performance test required in Condition D.1 of this

minor source permit, using the methods approved in 40 CFR 63.365(g), the owner/operator shall determine site-specific operating limits for the operating parameters approved by the Administrator.

2. The owner/operator shall monitor the parameters as approved by the Administrator in Condition C.1 of this minor source permit using the methods and procedures in 40 CFR 63.365(g).
3. The owner/operator shall measure and record, once per hour, the ethylene oxide concentration at:
 - a. the combined outlet of the aeration cells dry bed scrubber and the APCS; and
 - b. the outlet of the aeration cells dry bed scrubber.
4. Monitoring is required during those times when the aeration cells dry bed scrubber and/or APCS is operational.
5. The pressure drop across each of the dry bed scrubbers for the Processed Warehouse shall be monitored.

D. Recordkeeping and Reporting

1. The owner/operator shall maintain the following records:
 - a. The daily amount of ethylene oxide, in pounds, loaded into the sterilizers. The daily and twelve-month rolling total amount of ethylene oxide, in pounds, discharged from the entire facility.
 - b. The concentration of ethylene oxide at the following locations (as required in Condition C.3 of this permit.
 - i. the combined outlet of the aeration cells dry bed scrubber and the APCS; and
 - ii. the outlet of the aeration cells dry bed scrubber.
 - c. The pressure drop across each of the dry bed scrubbers for the Processed Warehouse shall be recorded weekly.
 - d. The dates the reactant media is changed in each of the dry bed scrubbers.
2. The owner/operator shall notify the Office of Air Resources, in writing, of the date of initial start-up of the primary tray aerators and the dry bed scrubbers for the Processed Warehouse no later than fifteen days after start-up.

3. The owner/operator shall notify the Office of Air Resources in writing , of any noncompliance with the terms of this permit or any other air pollution control rule or regulation within 30 calendar days of becoming aware of such occurrence and supply the director with the following information:
 - a. The name and location of the facility;
 - b. The subject source(s) that caused the noncompliance with the permit term;
 - c. The time and date of first observation of the incident of noncompliance;
 - d. The cause and expected duration of the incident of noncompliance;
 - e. The estimated rate of emissions (expressed in lbs/hr or lbs/day) during the incident and the operating data and calculations used in estimating the emission rate; and,
 - f. The proposed corrective actions and schedule to correct the conditions causing the incident of noncompliance.
4. The owner/operator shall notify the Office of Air Resources in writing of any planned physical or operational change to any equipment that would:
 - a. Change the representation of the facility in the application.
 - b. Alter the applicability of any state or federal air pollution rules or regulations.
 - c. Result in the violation of any terms or conditions of this permit.
 - d. Qualify as a modification under APC Regulation No. 9.

Such notification shall include:

- Information describing the nature of the change.
- Information describing the effect of the change on the emission of any air contaminant.
- The scheduled completion date of the planned change.

Any such change shall be consistent with the appropriate regulation and have the prior approval of the Director.

5. All records required in this permit shall be maintained for a minimum of five years after the date of each record and shall be made available to representatives of the Office of Air Resources upon request.

E. Other Permit Conditions

1. There shall be no bypassing of the air pollution control system during times when ethylene oxide emissions are being discharged to the device.
2. To the extent consistent with the requirements of this permit and applicable federal and state laws, the facility shall be designed, constructed and operated in accordance with the representation of the facility in the permit application dated July 1, 2019 prepared by Environmental Strategies & Management, Inc (ES&M), and later supplemented by:
 - a. ES&M on December 17, 2019 and September 4, 2020; and
 - b. Boston Scientific on December 21, 2020
3. Employees of the Office of Air Resources and its authorized representatives shall be allowed to enter the facility at all times for the purpose of inspecting any air pollution source, investigation any condition it believes may be causing air pollution or examining any records the Office of Air Resources requires to be maintained.
4. The owner/operator is subject to the requirements of the General Duty Clause, Section 112(r)(1) of the Clean Air Act. Under this clause, the facility is responsible for but not limited to:
 - a. identifying hazards that may result from accidental releases;
 - b. designing and maintaining a safe facility; and,
 - c. minimizing the consequences of releases when they occur.
5. At all times, including periods of startup, shutdown and malfunction, the owner/operator shall, to the extent practicable, maintain and operate the facility in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Office of Air Resources, which may include, but is not limited to, monitoring results, opacity observations, review of operating maintenance procedures and inspection of the source.
6. The facility is subject to the requirements of 40 CFR 63, Subpart A, "General Provisions" and Subpart O, "Ethylene Oxide Emissions Standards for Sterilization Facilities". Compliance with all applicable provisions therein,

including any monitoring required pursuant to Condition C.1, is required unless otherwise stated in this permit. If there is any conflict between any term or condition of this permit and the applicable provisions of 40 CFR 63, the owner/operator shall comply with the most stringent requirement.

7. The emission and dispersion characteristics of all sources of ethylene oxide at the facility shall be consistent with the parameters used in the air quality modeling to demonstrate that the emissions of ethylene oxide does not cause an impact, at or beyond the property line of the facility, which exceeds the Acceptable Ambient Level for that substance. The Office of Air Resources, in its sole discretion, may reopen this minor source permit if it determines that the emission and dispersion characteristics have changed significantly and that emission limitations must be revised to ensure compliance with Air Pollution Control Regulation No. 22.

F. Malfunctions

1. Malfunction means a sudden and unavoidable breakdown of process or control equipment. In the case of a malfunction of any air pollution control system, all reasonable measures shall be taken to assure resumption of the designed control efficiency as soon as possible. In the event that the malfunction of an air pollution control system is expected or may reasonably be expected to continue for longer than 24 hours and if the owner/operator wishes to operate the source on which it is installed at any time beyond that period, the Director shall be petitioned for a variance under Section 23-23-15 of the General Laws of Rhode Island, as amended. Such petition shall include, but is not limited to, the following:
 - a. Identification of the specific air pollution control system and source on which it is installed;
 - b. The expected period of time that the air pollution control system will be malfunctioning or out of service;
 - c. The nature and quantity of air contaminants likely to be emitted during said period;
 - d. Measures that will be taken to minimize the length of said period;
 - e. The reasons that it would be impossible or impractical to cease the source operation during said period.
2. The owner/operator may seek to establish that a malfunction of any air pollution control system that would result in noncompliance with any of the terms of this permit or any other applicable air pollution control rules and regulations was due to unavoidable increases in emissions attributable

to the malfunction. To do so, the owner/operator must demonstrate to the Office of Air Resources that:

- a. The malfunction was not attributable to improperly designed equipment, lack of preventative maintenance, careless or improper operation or operator error;
- b. The malfunction is not part of a recurring pattern indicative of inadequate design, operation or maintenance;
- c. Repairs were performed in an expeditious fashion. Off-shift labor and overtime should be utilized, to the extent practicable, to ensure that such repairs were completed as expeditiously as practicable.
- d. All possible steps were taken to minimize emissions during the period of time that repairs were performed.
- e. Emissions during the period of time that repairs were performed will not:
 - (1) Cause an increase in the ground level ambient concentration at or beyond the property line in excess of that allowed by Air Pollution Control Regulation No. 22 and any Calculated Acceptable Ambient Levels; and
 - (2) Cause or contribute to air pollution in violation of any applicable state or national ambient air quality standard.
- f. The reasons that it would be impossible or impractical to cease the source operation during said period.
- g. The owner/operator's actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs or other relevant evidence.

This demonstration must be provided to the Office of Air Resources within two working days of the time when the malfunction occurred and contain a description of the malfunction, any steps taken to minimize emissions and corrective actions taken.

The owner/operator shall have the burden of proof in seeking to establish that noncompliance was due to unavoidable increases in emissions attributable to the malfunction.

PCL XL error

Warning: IllegalMediaSource



ADVANCED AIR TECHNOLOGIES, INC.

300 Earl Sleseman Drive
Corunna, MI 48817
(Michigan - USA)

Phone: 989-743-5544
Fax: 989-743-5624
Toll Free: 800-295-6583

ISO 9001: 2015 Certified

Safe-Cell II Model DR-490 Installation & Operation Instructions

Application

The AAT Safe-Cell II Model DR-490 dry reactor system is used to treat air contaminated with low to moderate ppmv levels of EtO. A single DR-490 can treat an air flow rate up to 2000 scfm.

Principal of Operation

The Safe-Cell II technology eliminates ethylene oxide emissions by a process called chemisorption (adsorption accompanied by chemical reaction). The EtO-laden air is drawn through the reactant beds using an I.D. fan. The EtO is irreversibly reacted on the surface of the reactant beads and clean air discharged from the unit. The reactant material will eventually reach its capacity for EtO destruction and need replacement.

Note: The maximum air flow through the DR-490 is 2000 cfm, and exceeding this air flow rate may cause damage to the system and void the warranty.

Equipment Specifications

This Model DR-490 has the following features:

1. Material of Construction – 12 Ga. 304 S.S.
2. Inlet Duct Connections – (1) 14 in. dia. rubber sleeve
3. Outlet Duct Connection – (1) 14 in. dia. rubber sleeve
4. Number of Reactant Beds – (2) in parallel
5. Volume of Reactant Each Bed = 12 ft³
6. Depth of reactant Each Bed = 6 in.
7. Approximate Weight of Reactant Each Bed = 450 lb.
8. Operating Weight of Unit = 2500 lb.
9. Total EtO Treatment Capacity at 99% Removal Efficiency = 250 lb.
10. Air flow Capacity = 2000 cfm
11. Pressure Drop = 6-7 in. w.g. (at 2000 scfm)
12. Vacuum design = - 20 in. w.g.

Unpacking Crated Equipment

When unpacking this equipment, inspect it for damage that may have occurred in shipping. Check the contents of the packing skids against the packing list. Report any damage immediately to carrier. Failure to report shipping damage promptly will result in your becoming liable for repairs. If questions arise, call Advanced Air Technologies at 989-743-5544.

Note: This system is shipped with the reactant installed. It cannot be tipped to either side. It must remain vertical or the reactant will spill out. If you need to remove the reactant to install the system refer to the section, "Replacing the Safe-Cell II Reactant."

Installing the Safe-Cell II Model DR-490

Refer to the diagram below for identification of anchor lug and foundation requirements for proper installation of the unit.

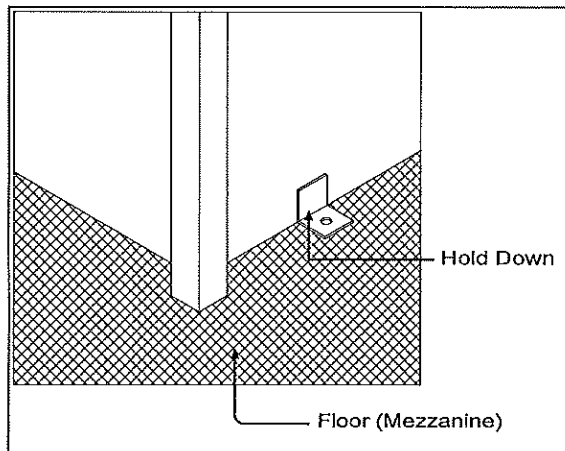


Figure 1

The Safe-Cell II Model DR-490 must be installed on a level foundation that provides firm and continuous support over the entire bottom area. The foundation must have sufficient strength to support the weight of the unit under operating conditions without any sagging or deflection. A local qualified engineer may need to be consulted on the foundation design and construction. The operating weight of the Safe-Cell DR-490 is 2500 pounds.

The support foundation can be a properly designed, reinforced concrete pad or, if elevated mounting is required, a properly designed structure with a sufficiently heavy

platform to meet the preceding requirements. All tie down lugs must be used to secure the DR-490A to its pad. The lugs must be shimmed whenever there is any space beneath them before tightening down (refer to Figure #1 above).

Locating the Safe-Cell II Model DR-490

Refer to Figure #2 when placing the unit, noting the service allowance that should be allocated. **This service area is necessary to change the reactant and work on the system as needed. If you do not have this amount of room the DR-490 may have to be moved to access it.**

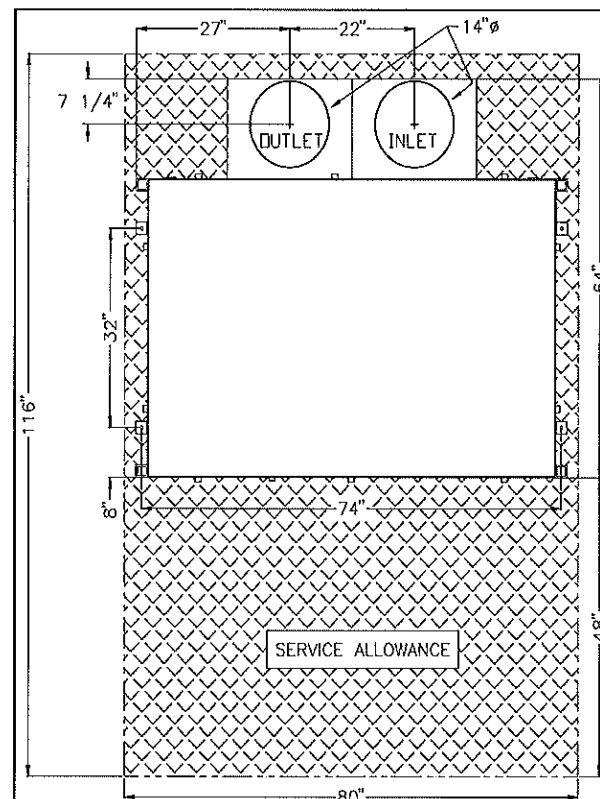


Figure 2

Locating the Exhaust Blower

When installing the exhaust blower pay close attention to the inlet and the outlet positions in order to position the blower correctly (refer to Figure 3). Note: The floor or mezzanine must be able to support the entire weight of the exhaust blower, which is typically in the range of 400-500 pounds.

For detailed information regarding installation of the exhaust blower, please consult the fan installation, maintenance, and operating instructions provided by the fan supplier.

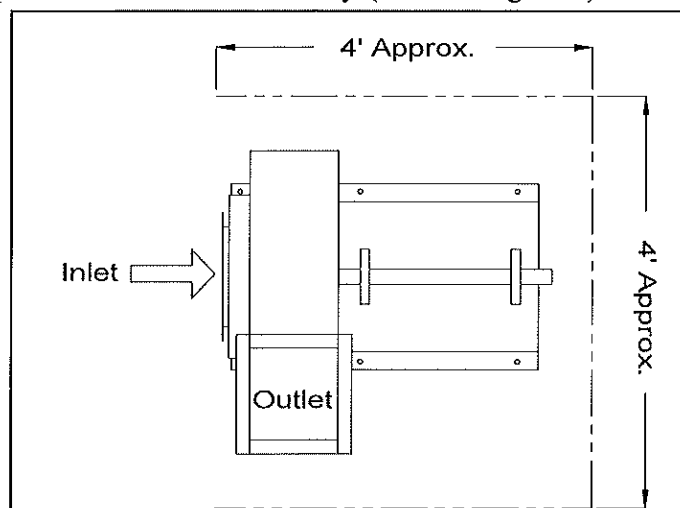


Figure 3

Connecting the Inlet & Outlet Duct

The inlet and outlet connections on the Safe-Cell Model DR-490 are 14" diameter. Flex connectors are provided for ease of installation. Please note that all ductwork must be independently supported from the Safe-Cell. The ductwork must be capable of handling the maximum vacuum that can be generated by the exhaust fan. Refer to Figure #4 when installing and connecting to the DR-490.

Note: To prevent problems with air leakage, both the inlet and the exhaust ductwork joints need to be either welded, gasketed, caulked and /or taped. It is important that there are no leaks in the ductwork.

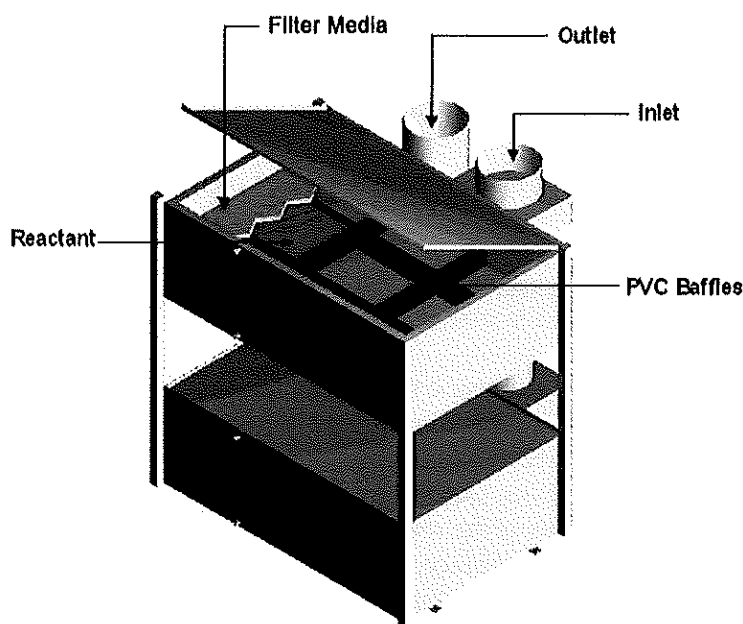


Figure 4

1. Identify the inlet and outlet connections on the Safe-Cell II Model DR-490.
2. Connect the exhaust outlet to the exhaust blower. **NOTE: A damper may be installed between the DR-490 and the exhaust fan to help regulate the airflow.**
3. Connect the inlet to the contaminated air supplies. **Note: a damper will need to be installed in the inlet ductwork to isolate the unit during reactant change-out.** The inlet connection to the source of EtO must be thoroughly sealed to prevent any water from entering the system, and also to prevent any contaminated air from escaping.
4. Run the exhaust ductwork from the blower to the desired exhaust point. Provide adequate protection to prevent rain from entering the duct, even when the blower is off. Check your local regulations for placement of this exhaust duct and also if you will need a stack. If so, stack exhaust velocity and height may also be mandated.

Leveling the Reactant Beds

After the system is in place and ductwork is connected, open the tops, remove the filter media and level the reactant beds. Make sure all divider sections are uniformly filled. It is okay if the reactant level exceeds the divider height, as long as the depth is uniform over the entire surface. When you are finished replace the filter media and press it down to the surface of the reactant tightly. Close each top and clamp them back down.

Installation & Start-Up Checklist

Before you start your system please go through this checklist.

1. The DR-490 is in place and lagged down.
2. The exhaust blower is in place and correctly connected to the exhaust ductwork and wired (being sure to comply with local codes).
3. The inlet & outlet on the DR-490 are connected to the ductwork.
4. A damper is installed between the DR-490 and the exhaust fan.
5. A damper is installed on the inlet side of the DR-490.
6. The reactant in each DR-490 bed has been leveled to the dividers.
7. The fan has been started and the air flow is within 5% of design.
8. The pressure drop across the unit is within 90% of design.

If you have met the above criteria, the system should now be ready to run.

Safe-Cell II Model DR-490 Maintenance

The following are recommendations for annual maintenance for the Safe-Cell Model DR-490.

1. Check all damper positions. Make sure they are in their correct positions.
2. Check the Safe-Cell II foam filter and make sure that it is pressed down to the surface of the reactant tightly, and free from dirt and debris.
3. Make sure that all of the divider sections in each reactant bed are uniformly filled with the Safe-Cell II reactant. It is okay if the reactant level exceeds the divider height, as long as the depth is uniform over the entire surface.
4. Inspect the cover gasket on each reactant bed for tears or rips. Also check to make sure that the gasket hasn't loosened from the DR-490.

Safe-Cell II Model DR-490 Exhaust Fan Maintenance

Refer to the fan O&M provided by the fan supplier for detailed information concerning fan maintenance and troubleshooting.

General Note: Do not attempt any maintenance on a fan unless the electrical supply has been completely disconnected and locked. In many cases, a fan can windmill despite the removal of all electrical power. The rotating assembly should be blocked securely before attempting maintenance of any kind.

The key to good maintenance is regular and systematic inspection of all fan parts. Strict adherence to an inspection schedule is essential.

Reactant Testing

We recommend the testing the exhaust air for EtO concentration to determine if the Safe-Cell II Model DR-490 reactant needs to be replaced. Test the exhaust outlet at 3-months from installation date, then at 1-month intervals, until you approach your permitted EtO exhaust limit. Record the pounds of EtO used to that point in time, and use this as the basis for scheduling future change-outs.

Replacing the Safe-Cell II Reactant

Although there are potential risks handling the reactant (see the SDS), it is no more dangerous than putting gasoline in your automobile. People have learned they must be careful with gasoline. Although the reactant is not flammable like gasoline, users must also learn to be careful. Accidents and injuries have seldom occurred in the use of our products. Help us maintain and improve this excellent record by following the recommendations outlined in the SDS located elsewhere in the O&M.

Note: Infrequent skin contact with reactant is essentially non-irritating and normally the reactant can be handled without any difficulties. Contact with abraded or injured skin can result in irritation and in extreme cases burns. Care should be taken to prevent getting reactant in the eyes. Use safety glasses or goggles. If the reactant gets in eyes, irrigate with flowing water immediately and continuously for 15 minutes and consult medical personnel. Generally, no EtO will be present in the spent reactant, however, in some cases where the systems has just been exposed to high concentrations of EtO, or if the system has been used long beyond its capacity, some residual EtO may be present. It is best to purge the Safe-Cell II System for two hours prior to opening the top cover. To do this, allow the Safe-Cell exhaust fan to run for 2 hours with no EtO in the air stream. Alternately, if your system procedures require it, you may work with a respirator or other recommended respiratory protection.

Tools: You will need a shop vac, replacement reactant, and an empty drum for spent reactant.

1. Turn off the Safe-Cell II fan and close the inlet and outlet dampers.
2. Remove the top cover by unlatching the latches. Be careful when removing the top cover as it is heavy and awkward. **Note: This is a two-man job.** Be careful not to damage the gasket.
3. Remove the filter media.
4. Scoop out the spent reactant with small bucket or scoop until most of it has been removed. Use the shop vacuum to suck up the remainder, removing all old material from the support screen. **NOTE: Be careful not to puncture the bottom support screen.**

5. Add new reactant up to the top of the divider and level. Make sure all divider sections are uniformly filled. It is okay if the reactant level exceeds the divider height, as long as the depth is uniform over the entire surface. **Note: Both reactant beds must be evenly filled with reactant or the airflow across the beds will be uneven.**
6. Replace the filter media and press down to the surface of the reactant tightly.
7. Inspect the top flange gasket and brush off any spilled reactant.
8. Replace the cover.
9. Repeat this procedure for the second reactant bed.
10. Cover and dispose of the spent reactant. See below for information regarding disposal.
11. Allow the DR-490 to run for 3 days, then check the reactant levels for settling. The reactant may need to be leveled again.

Guidelines for Proper Disposal of Safe-Cell II Reactant

The spent reactant can be readily disposed in a standard landfill. Most of our users do so. Others, who have an on-site incinerator such as some hospitals, opt to incinerate the spent material.

When the time is determined to replace reactant in the DR-490 please use the guidelines below.

1. Purge the unit using the exhaust fan by running clean air through it for at least 2-hours.
2. Shut off the exhaust fan, and lock-out / tag-out power to the motor.
3. Completely close isolation dampers in the two runs of inlet duct.
4. Attach a grounding clamp to an adequate grounding source, i.e., vacuum to drum (vacuuming dry reactant can produce static electricity, using grounding clamp will eliminate this).
5. Start vacuuming spent reactant into the system until the bed is 1/3 – 1/2 empty, at this time turn Vacuum power off, detach the drum lid, detach the grounding clamp, and wheel full drum to bulk waste container (you may desire not to fill the drum completely for easier removal). When working near the bottom of the bed use extreme caution with the end of the hose as to not the puncture the mesh screen.
6. Repeat Step 3 above until both beds are free of spent reactant.

Please feel free to call AAT should any questions or concerns arise.

Advanced Air Technologies wants every system to operate as designed and with the least amount of maintenance possible consistent with performance and safety. We encourage your questions and comments. We provide technical assistance for all our products as long as you own them. Please call the factory with any questions.

← BACK

**MATERIAL SAFETY DATA SHEET**

Issue Date: 2/28/2014

Print Date: 3/3/2014

Product Name: AAT SafeCell-II Reactant Media

AAT encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification**Product Name:** SafeCell II Reactant Media

Company Identification: Advanced Air Technologies, Inc.
300 Earl Slesseman Drive
Corunna, MI 48817 – USA
www.advairtech.com

Company Information Number: 989-743-5544
24 - Hour Emergency Contact: 989-743-5463
Local Emergency Contact: 989-743-5463

2. Hazards Identification**Emergency Overview****Color:** White to yellow**Physical State:** Beads**Odor:** Odorless to mild**Hazards of product:** DANGER! Causes severe eye burns. Evacuate area. Slipping hazard.**OSHA Hazard Communication Standard**

This is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Skin Contact: Prolonged exposure not likely to cause significant skin irritation. May cause more severe response if skin is abraded (scratched or cut).

Skin Absorption: No adverse effects anticipated by skin absorption. **Inhalation:** No adverse effects are anticipated from inhalation. Vapors are unlikely due to physical properties. For respiratory irritation and narcotic effects: No relevant data found. **Ingestion:** Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. **Aspiration hazard:** Based on physical properties, not likely to be an aspiration hazard.

3. Composition Information

Component	CAS #	Amount
-Sulfonated polymer of styrene, ethylstyrene and divinylbenzene in the hydrogen form	69011-20-1	>=90.0% - <= 99.0%
-Water	7732-18-5	>= 1.0% - <= 10.0%

4. First-aid Measures

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin Contact: Wash skin with plenty of water.

Eye Contact: Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Suitable extinguishing media

Water. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include but not limited to: Sulfur oxides. Organic sulfonates. Hydrocarbons. Carbon monoxide. Carbon dioxide. Benzene compounds.

Unusual Fire and Explosion Hazards: This material can burn.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. Cool surroundings with water to localize fire zone. **Special Protective Equipment for Firefighters:** Wear positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Spilled material may cause a slipping hazard. Ventilate area of leak or spill. Refer to Section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Sweep up. Recover spilled material if possible. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: Do not get in eyes. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Static electricity can accumulate on dry beads. Leave room for expansion as dry resin swells upon wetting and/or changing ionic form. Equipment construction material should be compatible with feed, regenerant, ionic form and effluent of the ion exchange process. Avoid generating and breathing dust. Good housekeeping and controlling of dusts are necessary for safe handling of product. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage

Store in a dry place keeping container closed when not in use. Preferred storage temp. in the lower half of the range given below.

Shelf life: Use within 36 Months

Storage temperature: 0-50°C 32° - 122°F

8. Exposure Controls / Personal Protection

Exposure Limits

None established

Personal Protection

Eye/Face Protection: Use chemical goggles.

Skin Protection: Wear clean, body-covering clothing.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. Examples of preferred glove barrier materials include: Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). Neoprene. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Under intended handling conditions, no respiratory protection should be needed.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

9. Physical and Chemical Properties

Appearance Physical State	Beads
Color	White to yellow
Odor	Odorless to mild
pH	3.5 - 4.5
Melting Point	Not applicable
Freezing Point	Not applicable
Boiling Point (760 mmHg)	Not applicable.
Flash Point -Closed Cup	Not applicable
Flammable Limits In Air	Lower: Not applicable Upper: Not applicable
Vapor Pressure	Not applicable
Vapor Density (air = 1)	Not applicable

Specific Gravity (H₂O = 1)	1.20 -1.26 <i>Literature</i>
Solubility in water (by weight)	insoluble in water
Partition coefficient, n-octanol/water (log Pow)	No data available for this product.
Autoignition Temperature	Not applicable
Decomposition Temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	no data available
Oxidizing properties	no data available

10. Stability and Reactivity

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible Materials: Avoid contact with oxidizing materials. Oxidizing agents such as nitric acid attack organic exchange resins under certain conditions. Before using strong oxidizing agents, consult sources knowledgeable in handling such materials. The severity of the reaction with oxidizing materials can vary from slight degradation to an explosive reaction.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aromatic compounds. Hydrocarbons. Organic sulfonates. Sulfur oxides.

11. Toxicological Information

Acute Toxicity

Ingestion: Typical for this family of materials. LD₅₀, rat > 5,000 mg/kg

Dermal: The dermal LD₅₀ has not been determined.

Inhalation: As product: The LC₅₀ has not been determined.

Eye damage/eye irritation

May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Skin corrosion/irritation

Prolonged exposure not likely to cause significant skin irritation. May cause more severe response if skin is abraded (scratched or cut).

Sensitization

Skin No relevant data found.

Respiratory No relevant data found.

Repeated Dose Toxicity No relevant data found.

Chronic Toxicity and Carcinogenicity No relevant data found.

Developmental Toxicity No relevant data found.

Reproductive Toxicity No relevant data found.

Genetic Toxicology No relevant data found.

12. Ecological Information

Toxicity

Not expected to be acutely toxic, but material in pellet or bead form may mechanically cause adverse effects if ingested by waterfowl or aquatic life.

Persistence and Degradability

This water-insoluble polymeric solid is expected to be inert in the environment. Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Bioaccumulative potential

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Mobility in soil

Mobility in soil: In the terrestrial environment, material is expected to remain in the soil. In the aquatic environment, material will sink and remain in the sediment.

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. Landfill.

14. Transport Information

DOT Non-Bulk	NOT REGULATED
DOT Bulk	NOT REGULATED
IMDG	NOT REGULATED
ICAO/IATA	NOT REGULATED

15. Regulatory Information

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	No
Delayed (Chronic) Health Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

To our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List and/or Pennsylvania Special Hazardous Substances List:

To our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

CEPA -Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

CANADIAN REGULATIONS

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS)

Classification for this product is:

D2B – eye or skin irritant

Refer elsewhere in the (M)SDS for specific warnings and safe handling information. Refer to the employer's workplace education program.

CPR STATEMENT: This product has been classified in accordance with the hazard criteria of the Canadian controlled Products Regulations (CPR) and the (M)SDS contains all the information required by CPR.

HAZARDOUS PRODUCTS ACT INFORMATION: This product contains the following ingredients which are Controlled Products and/or on the Ingredient Disclosure List (Canadian HPA section 13 and 14:

COMPONENTS:	CAS#	AMOUNT (%w/w)
Sulfonated copolymer of styrene and divinylbenzene in the hydrogen form	069011-20-7	> 90%

16. Other Information**Product Literature**

Additional information on this product may be obtained by calling your sales or customer service contact.

Recommended Uses and Restrictions Identified uses

Main application(s): Reagent for EtO destruction.

Revision Most recent revision(s) are noted by the bold bars surrounding each SDS section 1 through 16.

Legend

NA	Not available
WW	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for Activities such as exposure monitoring and medical surveillance if exceeded

APPENDIX: E
Summary of Draft Permit
proposed changes

The Table below, included at the request of RIDEM, is a summary of the most significant proposed changes to the minor source permit. However, it does not identify every proposed change to the language of the current permit.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS DEPARTMENT OF ENVIRONMENTAL MANAGEMENT OFFICE OF AIR RESOURCES		
MINOR SOURCE PERMIT		
Boston Scientific Corporation, 8 Industrial Drive, Coventry		
A. Emission Limitations 1 – 5		
Topic	Clarification	Rationale
Wet acid scrubber	Replaced Verantis with “wet acid scrubber” in the body of the permit	“Verantis” is the “brand name,” the equipment is a “wet acid scrubber.” Reference to Verantis is mentioned solely in the up-front authorization letter from RIDEM to BSC to be able to tie the specific equipment reference to the 2014 performance testing.
Back vent exhaust	Specified that air from the back vents have been treated by the APCS	Added to state the actual condition
Air Pollution Control System (APCS)	Specified this includes the wet acid scrubber & three dry bed scrubbers	Added to state the actual condition
Dry bed	Replaced AAT reactant media dry beds to “dry bed scrubbers” in the body of the permit	“AAT” is the “brand name”, the equipment is a “reactant media dry bed scrubber.” Reference to AAT is mentioned solely in the up-front authorization letter from RIDEM to BSC to be able to tie the specific equipment reference to the 2014 performance testing.
Ethylene Oxide Reduction	Scope: APCS (as now defined) and the aeration cells dry bed scrubber	Clarifying this is applicable to the combined discharge of the APCS and the aeration cells dry bed scrubber
	Included reference to Aeration Room Vent EO emission reduction to 1 ppmv or 99% reduction	Clarifying that this concentration limit, incorporated by reference from NESHAP Subpart O, is a 24-hour daily average ppm.
	Value: 99.9% – No change	EO usage will be reviewed daily, and the APCS efficiency will be calculated annually according to the formula identified in the permit.
	Time: “not defined” to annual; added a narrative description of the APCS efficiency calculation	
Ethylene Oxide Concentration	Concentration: 4.4ppmv – No change to value, added time reference	The 4.4ppmv represents a 24-hour daily average ppm (for the operating year).
Ethylene Oxide Emissions	67 lbs. per day – No change	No change requested.
	1,298 lbs. per consecutive 12-month period	No change in limit; stating our understanding of consecutive 12-month period.

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES**

MINOR SOURCE PERMIT

Boston Scientific Corporation, 8 Industrial Drive, Coventry

B. Operating Requirements 1 – 5

Topic	Clarification	Rationale
Average daily EO usage	Requesting condition be removed.	Facility will record usage on a daily basis to ensure it does not exceed the max daily usage limit.
Maximum daily EO usage	1,500 lbs. per day – No change	
Primary Tray Aerator Operation	Added reference to new primary tray aerator discharge to APCS	Incorporating reference to new primary tray aerator system, noting that only one primary tray aerator will discharge to the APCS at any time
Aeration Cells	Removed Condition B.5.	Removed this condition as it conflicts with condition B4. Note: there are only three aeration cells located at the facility.

C. Monitoring

Topic	Clarification	Rationale
Continuous Monitoring	Change from “collect bag sample” every 15 minutes to “... measure and record once per hour...”	As part of the performance testing process in 2014, Boston Scientific Coventry notified RIDEM that the site was implementing a continuous monitoring system. At the March 12, 2020 meeting between RIDEM and BSC, BSC again explained it was currently using a continuous monitoring system rather than bag samples.
Other		
Topic	Clarification	Rationale
Air Toxics Permit	Removed reference.	RIDEM terminated ATOP.

Revised Appendix E

December 2020

APPENDIX: E
Summary of Draft Permit
proposed changes

The Table below, included at the request of RIDEM, is a summary of the most significant proposed changes to the minor source permit. However, it does not identify every proposed change to the language of the current permit.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS DEPARTMENT OF ENVIRONMENTAL MANAGEMENT OFFICE OF AIR RESOURCES		
MINOR SOURCE PERMIT		
Boston Scientific Corporation, 8 Industrial Drive, Coventry		
A. Emission Limitations 1 – 5		
Topic	Clarification	Rationale
Wet acid scrubber	Replaced Verantis with “wet acid scrubber” in the body of the permit	“Verantis” is the “brand name,” the equipment is a “wet acid scrubber.” Reference to Verantis is mentioned solely in the up-front authorization letter from RIDEM to BSC to be able to tie the specific equipment reference to the 2014 performance testing.
Back vent exhaust	Specified that air from the back vents have been treated by the APCS	Added to state the actual condition
Air Pollution Control System (APCS)	Specified this includes the wet acid scrubber & three dry bed scrubbers	Added to state the actual condition
Dry bed	Replaced AAT reactant media dry beds to “dry bed scrubbers” in the body of the permit	“AAT” is the “brand name”, the equipment is a “reactant media dry bed scrubber.” Reference to AAT is mentioned solely in the up-front authorization letter from RIDEM to BSC to be able to tie the specific equipment reference to the 2014 performance testing.
Ethylene Oxide Reduction	Scope: APCS (as now defined) and the aeration cells dry bed scrubber	Clarifying this is applicable to the combined discharge of the APCS and the aeration cells dry bed scrubber
	Included reference to Aeration Room Vent EO emission reduction to 1 ppmv or 99% reduction	Clarifying that this concentration limit, incorporated by reference from NESHAP Subpart O, is a 24-hour daily average ppm.
	Value: 99.9% – No change	EO usage will be reviewed daily, and the APCS efficiency will be calculated annually according to the formula identified in the permit.
	Time: “not defined” to annual; added a narrative description of the APCS efficiency calculation	
Ethylene Oxide Concentration	Concentration: 4.4ppmv – No change to value, added time reference	The 4.4ppmv represents a 24-hour daily average ppm (for the operating year).
Ethylene Oxide Emissions	67 lbs. per day – No change	No change requested.
	1,298 lbs. per consecutive 12-month period	No change in limit; stating our understanding of consecutive 12-month period.

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES**

MINOR SOURCE PERMIT

Boston Scientific Corporation, 8 Industrial Drive, Coventry

B. Operating Requirements 1 – 5

Topic	Clarification	Rationale
Average daily EO usage	Requesting condition be removed.	Facility will record usage on a daily basis to ensure it does not exceed the max daily usage limit.
Maximum daily EO usage	1,500 lbs. per day – No change	
Primary Tray Aerator Operation	Added reference to new primary tray aerator discharge to APCS	Incorporating reference to new primary tray aerator system, noting that only one primary tray aerator will discharge to the APCS at any time
Aeration Cells	Removed Condition B.5.	Removed this condition as it conflicts with condition B4. Note: there are only three aeration cells located at the facility.

C. Monitoring

Topic	Clarification	Rationale
Continuous Monitoring	Change from “collect bag sample” every 15 minutes to “... measure and record once per hour...”	As part of the performance testing process in 2014, Boston Scientific Coventry notified RIDEM that the site was implementing a continuous monitoring system. At the March 12, 2020 meeting between RIDEM and BSC, BSC again explained it was currently using a continuous monitoring system rather than bag samples.
Other		
Topic	Clarification	Rationale
Air Toxics Permit	Removed reference.	RIDEM terminated ATOP.

Table 1 Exhaust Fan Schedule BSC Coventry:

Exhaust from:	Fan ID	Average Annual Fan Speed (cfm):	notes
Aeration Room and Dry Bed Room	EF-5	2,788	
8,9,10 Chamber Front Floor Sweeps	EF-6	2,357	
Legacy Chamber Floor Sweeps and Pump Room	EF-7	5,582	vents to combined stack
Combined Outlet from APCS	EF-1	5,105	
Drum Room	EF-3	496	dedicated stack
APCS Building/Acid Room	EF-4	840	dedicated stack
Processed Warehouse	EF-8	6,123	dedicated stack

